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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/651,550	08/29/2003	Dimitry Gorinevsky	H0005812-1170	1232

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HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER	
PRETLOW, DEMETRIUS R	
ART UNIT	**PAPER NUMBER**
2863	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/651,550	GORINEVSKY, DIMITRY	
	Examiner	Art Unit	
	Demetrius R. Pretlow	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-12,14-34 and 36-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11,21-23 and 33* is/are rejected.

7)☒ Claim(s) *2,4-10,12,14-20,24,26-32,34 and 36-42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,11,21,22,23 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibhatla et al. (US 6,532,412 B2) in view of de la Vega et al (Efficient Computation of Locally Monotonic Regression). Adibhatla et al. teach a performance estimator (processor), the performance estimator receiving sensor data and generating performance parameter estimates for the mechanical system; Note column 2, lines 6-8 and lines 41-47. Adibhatla et al. teach a predictive trending mechanism, the predictive trending mechanism receiving the performance parameter estimates and determining an estimated trend for the performance parameters (Note column 1, lines 65-67 and column 2, lines 1-8 and column 3, lines 55-67) Adibhatla et al. teach the use of a regression note claim 6, lines 3. Adibhatla et al. does not explicitly teach the estimated trend determined by the predictive trending mechanism includes a prediction of future performance, However this appears to be inherent to trend analysis of Adibhatla et al. Note Adibhalta et al. column 1, lines 65-67 to column 2, lines 1-8.

Adibhatla et al. does not teach the use of a monotonic regression.

de la Vega et al. teach the use of a monotonic regression. Note de la Vega page 263, line 1 of the Introduction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Adibhatla et al. to include the teaching of de la Vega et al. because it would provide smooth signals. Note de la Vega et al. lines1-4 of the Introduction.

In reference to claim 11, Adibhatla et al. teach receiving sensor data from the mechanical system. Note column 1, lines 59-60. Adibhatla et al. teach generating performance parameter estimates for the mechanical system from the received sensor data; Note column 2, lines 48-60. Adibhatla et al. teach determining an estimated trend for the performance parameter through regression of the performance parameter estimates. (Note column 1, lines 65-67 and column 2, lines 1-8 and column 3, lines 55-67). Adibhatla et al. teach the use of a regression note claim 6, lines 3. Adibhatla et al. does not explicitly teach the estimated trend includes a prediction of future performance, However this appears to be inherent to trend analysis of Adibhatla et al. Note Adibhalta et al. column 1, lines 65-67 to column 2, lines 1-8.

Adibhatla et al. does not teach the use of a monotonic regression.

de la Vega et al. teach the use of a monotonic regression. Note de la Vega page 263, line 1 of the Introduction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Adibhatla et al. to include the teaching of

de la Vega et al. because it would provide smooth signals. Note de la Vega et al. lines1-4 of the Introduction.

In reference to claim 21, Adibhatla et al. teach a performance estimator, the performance estimator receiving sensor data and generating performance parameter estimates for the mechanical system; Note column 2, lines 48-60. Adibhatla et al. teach a predictive trending mechanism, the predictive trending mechanism receiving the performance parameter estimates and determining an estimated trend for the performance parameters through regression of the performance parameter estimates; (Note column 1, lines 65-67 and column 2, lines 1-8 and column 3, lines 55-67) Adibhatla et al. teach the use of a regression note claim 6, lines 3. Adibhatla et al. does not explicitly teach the estimated trend determined by the predictive trending mechanism includes a prediction of future performance, However this appears to be inherent to trend analysis of Adibhatla et al. Note Adibhalta et al. column 1, lines 65-67 to column 2, lines 1-8.

Adibhatla et al. does not teach the use of a monotonic regression.

de la Vega et al. teach the use of a monotonic regression. Note de la Vega page 263, line 1 of the Introduction.

Adibhatla et al. teach signal bearing media (memory coupled to processor which is programmed) bearing said trending program. Note column 2, lines 44-46 and claim 1, lines 3-4 (showing that the processor is programmed).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Adibhatla et al. to include the teaching of

de la Vega et al. because it would provide smooth signals. Note de la Vega et al. lines1-4 of the Introduction.

In reference to claim 33, Adibhatla et al. teach a processor; Note column 2, lines 41-47. Adibhatla et al. teach a memory coupled to the processor. Note column 2, lines 44-46. Adibhatla et al. teach a trending program residing in the memory and being executed by the processor. Note claim 1, lines 3-4,7-9. Adibhatla et al. teach a performance estimator, the performance estimator receiving sensor data and generating performance parameter estimates for the mechanical system; Note column 2, lines 6-8 and lines 41-47 and Adibhatla et al. teach a predictive trending mechanism, the predictive trending mechanism receiving the performance parameter estimates and determining an estimated trend for the performance parameters through regression of the performance parameter estimates. (Note column 1, lines 65-67 and column 2, lines 1-8 and column 3, lines 55-67) Adibhatla et al. teach the use of a regression note claim 6, lines 3. Adibhatla et al. does not explicitly teach the estimated trend determined by the predictive trending mechanism includes a prediction of future performance, However this appears to be inherent to trend analysis of Adibhatla et al. Note Adibhalta et al. column 1, lines 65-67 to column 2, lines 1-8.

Adibhatla et al. does not teach the use of a monotonic regression.

de la Vega et al. teach the use of a monotonic regression. Note de la Vega page 263, line 1 of the Introduction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Adibhatla et al. to include the teaching of de la Vega et al. because it would provide smooth signals. Note de la Vega et al. lines1-4 of the Introduction.

In reference to claim 22, Adibhatla et al. teach the signal bearing media (memory) is used to store (record) the program. Note column 2, lines 44-46 and claim 1, lines 3-4 (showing that the processor is programmed).

In reference to claim 23, Adibhatla et al. teach the signal bearing media (memory) is coupled to the processor thus the data in the memory is inherently transferred to the processor. Note column 2, lines 44-46 and claim 1, lines 3-4 (showing that the processor is programmed).

Allowable Subject Matter

Claim 2,4-10,12,14-20,24,26-32,34,36-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach combination of claim limitations of claim 2, in particular the limitations of the estimated trend determined by the predictive trending mechanism includes a filtered estimate of the performance parameter.

The prior art of record does not teach combination of claim limitations of claim 4, in particular the limitations of the predictive trending mechanism comprises a quadratic programming problem solver.

The prior art of record does not teach combination of claim limitations of claim 5, in particular the limitations of the predictive trending mechanism performs a first order monotonic regression analysis through imposing a linear constraint of a monotonic data change in a quadratic programming problem.

The prior art of record does not teach combination of claim limitations of claim 6, in particular the limitations of the predictive trending mechanism performs a second order monotonic regression analysis, the second-order monotonic regression analysis determining an estimated trend for a primary fault condition and an estimated trend for secondary damage accumulating because of this primary fault condition.

The prior art of record does not teach combination of claim limitations of claim 8, in particular the limitations of the predictive trending mechanism includes at least one tuning parameter selected to achieve a desired tradeoff-in noise rejection and data following performance for the estimated trend.

The prior art of record does not teach combination of claim limitations of claim 9, in particular the limitations of the performance estimator generates the performance parameter estimates for the mechanical system from sensor data residuals.

The prior art of record does not teach combination of claim limitations of claim 12, in particular the limitations of the estimated trend includes a filtered estimate of the performance parameter.

The prior art of record does not teach combination of claim limitations of claim 14, in particular the limitations of the step of determining an estimated trend for the performance parameter through monotonic regression of the performance parameter estimates comprises determining the estimated trend with a quadratic programming problem solver.

The prior art of record does not teach combination of claim limitations of claim 15, in particular the limitations of the step of determining an estimated trend for the performance parameter through monotonic regression of the performance parameter estimates comprises a first order monotonic regression analysis through imposing a linear constraint of a monotonic data change in a quadratic programming problem.

The prior art of record does not teach combination of claim limitations of claim 16, in particular the limitations of the step of determining an estimated trend for the performance parameter through monotonic regression of the performance parameter estimates comprises a second order monotonic regression analysis, the second-order monotonic regression analysis determining an estimated trend for a primary fault condition and an estimated trend for secondary damage accumulating because of this primary fault condition.

The prior art of record does not teach combination of claim limitations of claim 18, in particular the limitations of the step of determining an estimated trend for the performance parameter through monotonic regression of the performance parameter estimates comprises selecting at least one tuning parameter to achieve a desired tradeoff in noise rejection and trend following performance.

The prior art of record does not teach combination of claim limitations of claim 19, in particular the limitations of the step of generating performance parameter estimates for the mechanical system from the received sensor data comprises generating residuals from the received sensor data.

The prior art of record does not teach combination of claim limitations of claim 24, in particular the limitations of the estimated trend determined by the predictive trending mechanism includes a filtered estimate of the performance parameter.

The prior art of record does not teach combination of claim limitations of claim 26, in particular the limitations of the wherein the predictive trending mechanism comprises a quadratic programming problem solver.

The prior art of record does not teach combination of claim limitations of claim 27, in particular the limitations of the predictive trending mechanism performs a first order monotonic regression analysis through imposing a linear constraint of a monotonic data change in a quadratic programming problem.

The prior art of record does not teach combination of claim limitations of claim 28, in particular the limitations of the predictive trending mechanism performs a second order monotonic regression analysis, the second-order monotonic regression analysis determining an estimated trend for a primary fault condition and an estimated trend for secondary damage accumulating because of this primary fault condition.

The prior art of record does not teach combination of claim limitations of claim 30, in particular the limitations of the predictive trending mechanism includes at least

one tuning parameter selected to achieve a desired tradeoff in noise rejection and data following performance for the estimated trend.

The prior art of record does not teach combination of claim limitations of claim 31, in particular the limitations of the performance estimator generates the performance parameter estimates for the mechanical system from sensor data residuals.

The prior art of record does not teach combination of claim limitations of claim 34, in particular the limitations of the estimated trend determined by the predictive trending mechanism includes a filtered estimate of the performance parameter.

The prior art of record does not teach combination of claim limitations of claim 36, in particular the predictive trending mechanism comprises a quadratic programming problem solver.

The prior art of record does not teach combination of claim limitations of claim 37, in particular the predictive trending mechanism performs a second order monotonic regression analysis, the second-order monotonic regression analysis determining an estimated trend for a primary fault condition and an estimated trend for secondary damage accumulating because of this primary fault condition.

The prior art of record does not teach combination of claim limitations of claim 38, in particular the predictive trending mechanism performs a second order monotonic regression analysis, the second-order monotonic regression analysis determining an estimated trend for a primary fault condition and an estimated trend for secondary damage accumulating because of this primary fault condition.

The prior art of record does not teach combination of claim limitations of claim 40, in particular the predictive trending mechanism includes at least one tuning parameter selected to achieve a desired tradeoff in noise rejection and data following performance for the estimated trend.

The prior art of record does not teach combination of claim limitations of claim 41, in particular the e performance estimator generates the performance parameter estimates for the mechanical system from sensor data residuals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetrius R. Pretlow whose telephone number is (571) 272-2278. The examiner can normally be reached on Mon.-Fri. 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Demetrius R. Pretlow

Patent Examiner

MICHAEL NGHIEM
PRIMARY EXAMINER